Amendments to the Claims

1. (Currently amended) A method of decoding and of joint equalization of a digital signal protected by a code defined by a trellis, this signal being transmitted on a radio frequency channel according to a transmission with non-interleaved packets, each packet including a known sequence and a sequence of coded data, each sequence of bits $x = \{x_n\}$, from current bit x_n, subjected to [[the]] a coding process defined by a trellis and to a modulation process, having a corresponding sequence of symbols $y = \{y_n\}$, from current symbol y_n, satisfying the relationship $y_n = f(x_n; x_{n-1}; \ldots ; x_{n-K})$, the sequence of bits prior to the current bit $e_{n-1}(x) = \{x_{n-1}; x_{n-2}; \ldots ; x_{n-K}\}$ representing the state of the coding process at the previous state n-1 and the current symbol y_n of the sequence of symbols satisfies the relationship $y_n = f(x_n, e_{n-1}(x))$, the sequence of symbols being submitted to a transverse filtering with finite impulse response, with filtering coefficients $\{h_0; h_1; \ldots ; h_L\}$ representative of the radio frequency channel in order to generate a sequence of observed symbols $r = \{r_n\}$, each observed symbol r_n satisfying the relationship $r_n = z_n+b_n$ where z_n designates a current symbol at the output of the channel and b_n a residual noise affecting the channel, each current symbol at the output of the channel z_n satisfying the relationship:

$$\begin{aligned} z_n &= g(y_n; y_{n-1}; \ldots ; y_{n-L}) \\ &= h_0 y_n + h_1 y_{n-1} + \ldots + h_L y_{n-L} \\ &= \phi(x_n; x_{n-1}; \ldots ; x_{n-L-K}) \end{aligned}$$

this method consisting: ~~in estimating each current bit x_n of the sequence of bits $x = \{x_n\}$~~ in estimating each current bit x_n of the sequence of bits $x = \{x_n\}$ in the sense of the maximum likelihood by minimizing the quadratic error between observed symbol and current symbol at the channel output, where the quadratic error function is

$$\varepsilon^2(x) = \sum_n |r_n - z_n|^2 = \sum_n \left| r_n - \phi(x_n; x_{n-1}; \ldots ; x_{n-L-K})^2 \right|,$$

wherein, for any current symbol at the output of the channel z_n arising from the transmission, because of multiple paths, the successive sequence of the symbols $\{y_{n-L}; y_{n-L+1}; y_{n-1}; y_n\}$ arising from the coding process for the sequence of bits $x = \{x_n\}$ corresponding to successive states $e_{n-L}(x); e_{n-L+1}(x); \ldots ; e_{n-1}(x)$ and finally $e_n(x)$, corresponding to branches between successive state nodes of [[the]] a trellis of the code, this method moreover consisting:

- in calculating said quadratic error on the basis of the set of observed symbols and of the successive state branches of the coding process, on the basis of the branch metric of the last transition $e_{n-1}(x) \rightarrow e_n(x)$ of the coding process, according to the relationship:

$$\varepsilon^2(x) = \sum_n \left| r_n - \left\{ \sum_{k\geq 0} h_k y_{n-k} \right\} \right|^2 = \sum_n \left| r_n - h_0 y_n - \left\{ \sum_{k\geq 1} h_k y_{n-k} \right\} \right|^2$$

said branch metric being calculated by ascending the successive states at the level of each state node over a length equal to the memory of the channel;

- in inhibiting, in the course of this ascent, [[the]] a process of error propagation because of the calculation of the branch metrics, by memory-storage at the level of each node i and at each instant of a number $S > 1$ of survivors, each survivor being defined by an accumulated metric $M(i,t,k)$ for the node i at the instant t for the survivor of ranking k in question, $k \in [0, \ldots, S-1]$, and by an updating of each survivor at the instant $t + 1$ for each node by calculation of a branch metric and selection of the S best branch metrics from among the set of possible branch metrics at the node in question;

- in determining the final survivor with the smallest metric, $M_m(0,\tau,1)$, and in reading the corresponding sequence of information bits, by ascending successive state nodes.

2. (Currently amended) The method according to Claim 1, wherein it further consists:

- in determining a next-final survivor with metric $M_{m'}(0,\tau,1)$, adjacent to and immediately above the smallest metric,

- in calculating a metric offset, the absolute value in the difference in metrics between the smallest metric and the immediately higher adjacent metric, $\delta_M = |M_m - M_{m'}|$;

- in comparing this metric offset with a threshold value $\delta_M \leq S_e$, this threshold value S_e being defined on the basis of experimental results and of conditions of use;

- in rejecting the final survivor when said metric offset satisfies the comparison of being below this threshold value~~, which makes it possible to enhance the reliability of the method~~.